

Quality of life, personality changes, self esteem, and emotional stability after breast augmentation

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Abstract

Background Although breast augmentation is a common intervention in esthetic surgery, there aren't enough reports evaluating accurately patients' satisfaction retrospectively. In a previous study, we evaluated the quality of life in patients undergoing esthetic surgery. In the present study, we split up the operative indication and examined the quality of life, self-esteem, and emotional stability after breast augmentation only.

Methods Seventy-three patients underwent esthetic breast augmentation (1995–2009) were included in the study. The testing instruments consisted of a self-developed indication specific questionnaire especially for breast augmentation and three widely used standardized questionnaires (FLZM, FPI-R, and the RSES), which can be compared to norm data.

Results Although expected by just 11 % preoperatively, an improved sexuality was stated by 71 % of the patients post-

operatively. A very high percentage (74 %) of the participants declared a better quality of life overall. Both of these findings were parallel confirmed by the FLZM. Significantly increased values were found for the following FLZM items: "housing/living conditions" ($p=0.008$), "partner/sexuality" ($p=0.042$), "mobility" ($p=0.019$), and "independence from help/care" ($p=0.026$). In the module "Satisfaction with Appearance/Body Image", satisfaction with breasts ($p<0.001$) and 10 further body parts increased significantly. The data revealed by the FPI questionnaire and the RSES questionnaire showed that participants' emotional stability was very well balanced and their self-esteem very high.

Conclusions Breast augmentation is a common surgical intervention widely accepted and very well tolerated among female patients, achieving a better quality of life, due to significant changes to their sexuality, satisfaction with their body image, and personal well-being.

Level of Evidence: Level III, risk/prognostic study.

Keywords Quality of life · Patients' satisfaction · Body image · Self-esteem · Emotional stability · Breast augmentation

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Introduction

Nowadays "Quality of life" (QOL) gains more and more in significance as a tool for the measurement of patients' satisfaction, since it comprises an important segment of everyday life. It is a multi-dimensional concept, as it can be affected by the presence of factors which positively affect satisfaction, as well as by the absence of others with a negative effect on it.

The term "QOL" was introduced in the 70's, but it was in the 90's that the medical community commenced considering

a patient's subjective evaluation concerning the outcome of one's therapy [1]. The World Health Organization (WHO) described QOL in 1998 as "the individually experienced extent of the satisfaction of fundamental human needs and successes of actions" [2] developing parallel a questionnaire for its research. An increasing scientific interest in QOL as a therapeutic goal parameter arose since the end of the 1990s [3], released by the insight that psychosocial factors strongly influence physical health [4]. Patients frequently are no longer satisfied just by complication-free results, but favor an optimal esthetic result and its impact to their emotional and mental satisfaction [5]. The satisfaction of the surgeon with the outcome is no more the key point determining a successful treatment. Its evaluation from the patient's perspective is also crucial. QOL is not only used for evaluations, but also for planning surgical treatments and it is an important criterion for surgical indication [6].

In our previous studies regarding (a) QOL following esthetic surgery as a whole [7] and (b) QOL following breast reconstruction [8, 9], we used the FLZ^M questionnaire proving that elective procedures in plastic surgery have throughout a positive effect on the multidimensional construct of QOL, as mentioned elsewhere [10]. Since the patients of those studies comprised a heterogeneous group (undergoing different esthetic interventions), the conclusions could not be applied to each specific esthetic operative procedure. Therefore, we subdivided these patients into separate groups according to their operative indication. Evaluation of abdominoplasty has already been described elsewhere recently [11]. Moreover, since patients' emotional stability and self-esteem have not been considered till now as crucial points in the measurement of QOL, international studies regarding QOL were not able until now to draw conclusions concerning patients' postoperative psychological and emotional status. For this reason, in the present study, we used two standardized questionnaires in order to examine crucial parameters of our patients' psyche.

Physical beauty is socially and psychologically gifted influencing our being, our social life, our behavior, and our nature. If this should be true, is it then possible to increase the quality of life by undergoing an elective esthetic surgery? In the present study, we investigated whether breast augmentation positively affects QOL and its possible effects on patients' psychological status postoperatively.

Materials and methods

The study was designed as a retrospective study in our Department of Plastic Surgery and Hand Surgery, including patients operated between 1995 and 2009. Ninety in-patients undergone solely esthetic breast augmentation fulfilled the inclusion criteria for this study (age range, 17 to 57; mean age, 31.8 years old). An 18-sheeted indication specific

questionnaire was sent to 90 patients and 73 responded, agreeing to participate. Almost 20 % ($n=14$) of the participants took part additionally in a postoperative clinical examination, where a photographic documentation and specific clinical measurements were made. All persons gave their informed consent prior to their inclusion in the study.

The aforementioned questionnaire included questions on demographic and socioeconomic characteristics of the patients and furthermore, two questionnaires developed especially for patients who underwent breast augmentation, examining the postoperative complications of the procedure and the postoperative status of the patient, respectively. Furthermore, the standardized self-assessment test on life satisfaction (FLZ^M) by Herschbach and Henrich [12], the revised Freiburg Personality Inventory (FPI-R) by Fahrenberg [13], and finally, the Rosenberg Self-Esteem Scale (RSES) [14] were also included. The data of these standardized testing instruments could be compared to norm data.

1. *Self-developed and indication specific questionnaire for breast augmentation.* Introductory, the patients were asked questions regarding their age, weight, their concerns regarding the intervention and the outcome, information source for the operation, complications, and ten pairs of questions of everyday activities before and after the operation. The questionnaire regarding the complications includes questions on patient's satisfaction with the postoperative result, on the experiences with pain, hematomas, hospitalization, etc., and it is exclusively drawn up for breast augmentation procedures.
2. *FLZ^M (questions on life satisfaction).* The FLZ^M is a self-evaluation questionnaire standardized for German speaking countries with existing norm population data; we compared our results with [12]. It evaluates the subjective QOL (weighed satisfaction), consisting of three modules "General Satisfaction", "Satisfaction with Health", and "Satisfaction with Appearance (Body Image)". Each patient was asked to rate every item firstly for its subjective importance, and secondly for its subjective degree of satisfaction on a five-point scale.
3. *Freiburg Personality Inventory—Revised.* The FPI-R is a multidimensional test, which allows the self-assessment of personality's characteristics. The questionnaire covers 138 statements about certain behaviors, attitudes, and habits, which can be answered either as true or as false. In our study, we chose only the part "Emotion", in order to achieve a shorter completion time and to check the emotional stability of the participants. The results can be compared to a control group ($n=2035$) representing the German population and interpreted by the following classifications: scores 1–4 mean a very stable and positive emotionality, scores 5–7 mean a rather stable emotionality without behavioral problems, while scores bigger than 7

(8–14) a problematic emotionality followed often by an unhealthy socio-emotional behavior [13].

4. **Rosenberg Self-Esteem Scale.** The RSES is one of the most widely used self-esteem measuring items in social science research, comprising an important element in achieving a one-dimensional measure of global self-esteem [14]. The 10 items included are answered on a four-point scale ranging from “strongly agree” to “strongly disagree”. The scale ranges from 10–40, with 40 indicating the highest score possible. There are no discrete cut-off points to delineate high and low self-esteem but comparisons can be drawn with international results from 53 nations with 16,998 participants reporting a mean value of 30.85, which means that scores higher than 30 indicate a higher self-esteem [15]. The control group of the German population with 782 participants reached a mean value of 31.73.

For the statistical analysis of the data *SPSS 17.0* for Windows (SPSS Inc., Chicago, USA) was used. The data distribution of each variable was evaluated using the “one-sample *t* test”, and for all tests, the overall statistical level of significance was set at $p < 0.05$.

Results

Evaluation of the self-developed and indication specific questionnaire The age of our average patient was 31.8 years old (17–57 years old), while 75 % were younger than 40 years. Two peak values (ages 20 and 34 years old) could be determined (Fig. 1). The time interval of the consideration for the operation reached a mean value of 4.7 years, with 5 years being the most frequent answer (21 %). Regarding the information sources about breast augmentation, mass media was the most common answer (31 %, TV; magazines; Internet) (Fig. 2). One hundred percent of the participants expected an improvement to their “personal well-being” and 66 %

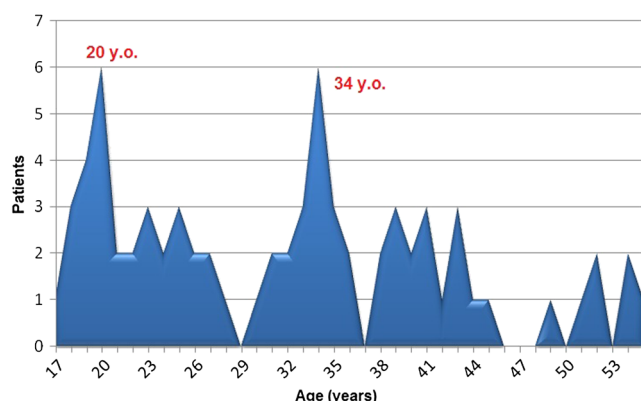
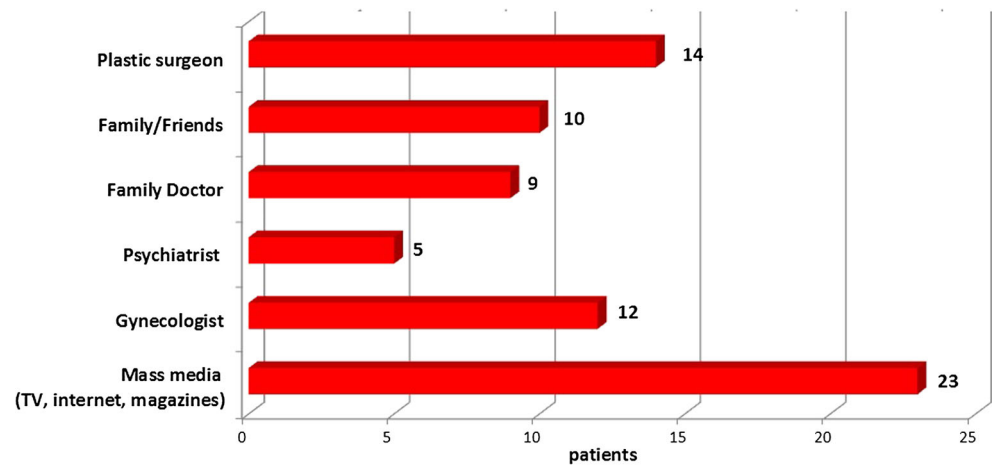


Fig. 1 Patients' age at the time of operation

advantages in the field “family/partner”. An improved sexuality was mentioned only by every tenth patient (11 %) (Fig. 3). Eighty-nine percent of the procedures developed without any complications, although almost every second patient was stressed about the possible complications of the procedure. Thirty-four percent of them didn't have any concerns at all. The mean worth of the total operation's burden (scale 0–10, 10=ultimate pain) was 3.81. Fifty percent of the patients answered 0–3, meaning very limited pain. Twenty-one percent declare as the most annoying complication the loss of skin's sensitivity in the breast area, while pain/edema was also often (18 %/20 %). Postoperative hemorrhage, wound infections, and asymmetry of the breast were rather uncommon (11, 3, and 1 %, respectively). Regarding the postoperative changes in the way of their life, 84 % agreed that they changed their dressing code, preferring a décolleté neckline, stretchy clothes, and leaving behind clothes with turtle neck collar or loose clothes to hide their small breasts. Ninety-nine percent stated that their personal well-being was improved, a fact that 100 % of them reported as an expected profit preoperatively (Fig. 4). On the other hand, although hardly 11 % of the patients expected an improvement of their sexuality, the results marked an increase of this parameter in 71 % of them, a statistically significant difference, comprising one of the most crucial implications of this study ($p < 0.0001$) (Fig. 5). This conclusion is directly correlated with the results regarding patients' satisfaction with their new breast. They were asked to demonstrate their satisfaction grade about seven characteristics of their “new” breast, using a scale from 0 to 10 (10=absolutely satisfied), reaching really high satisfaction rates (Fig 6). These high rates of satisfaction justify the answers the patients gave when asked “would you decide again for the same operation?” and “would you recommend the same operation to your acquaintances?” (positive answers 93 % and 69 %, respectively). In order to obtain a more distinct impression on the influence of the operation's outcomes on the patient's everyday life, we used 10 pairs of questions regarding common everyday activities (pre- and postoperative status). The statistical evaluation of the answers resulted in a statistically significant outcome in 9 out of 10 questions (Table 1).

Evaluation of the FLZ^M The “weighted satisfaction” for every item and the sum scores of the two modules were calculated according to the manual of the questionnaire and compared to the data of a specific control group representing the German “healthy” population at the age of 16–90 years. The comparison for the module “General Life Satisfaction” showed significantly higher scores for the aspects “living condition” and “partner/sexuality” ($p = 0.008$ and $p = 0.042$, respectively) (Table 2). The rest items suggested improvements but with no significant importance. Regarding the “Satisfaction with Health” module,

Fig. 2 Information sources for breast augmentation



significant higher scores were reached for the aspects “mobility” ($p=0.019$) and “independence from help” ($p=0.026$) (Table 3). The results from the answers given in the third part of the FLZ^M questionnaire (“Satisfaction with Appearance”/Body Image) were statistically compared with the T0 and T1 data from our previous study as no relevant date existed in the FLZ^M bibliography [7]. This way, we achieved a double comparison for “Body Image”: T0 representing the “norm data” preoperatively and T1 postoperatively. The satisfaction with the item “Breasts” was significant higher ($p<0.001$). Furthermore, their satisfaction with nine more body parts plus the “whole body” satisfaction was also significantly higher (shoulders, waist, hips, etc.). By comparing the values with the T1 data, the scores for their breasts (and seven more body parts) were still significantly higher ($p=0.01$) (Tables 4 and 5).

Evaluation of the FPI-R The FPI-R questionnaire results indicated a very well balanced emotional stability of the patients postoperatively, significantly higher when compared with the FPI-R norm population data (mean score=4.7, $p=0.0004$) (Table 6).

Evaluation of the RSES The results of the Rosenberg Self-Esteem Scale showed with a mean score of 33 (range 10–40) that the participants had postoperative a high self-esteem even higher than the average of the norm population (Table 7). According to the literature, all scores above 30 stand for a “high self-esteem” [14].

Evaluation of the clinical outcomes As mentioned above, ca. 20 % of the patients agreed to participate in a clinical examination and a photographic documentation. The distance between specific body parts was measured and then compared with the respective distance of the “ideal breasts” [16]. The results demonstrate that patients’ satisfaction with their breasts is directly correlated with their harmonic appearance after the procedure (Fig. 7).

Discussion

Physical beauty is a gift affecting both our social life and behavior [17–19]. However, esthetic surgery is still sometimes

Fig. 3 Patients’ expected benefits

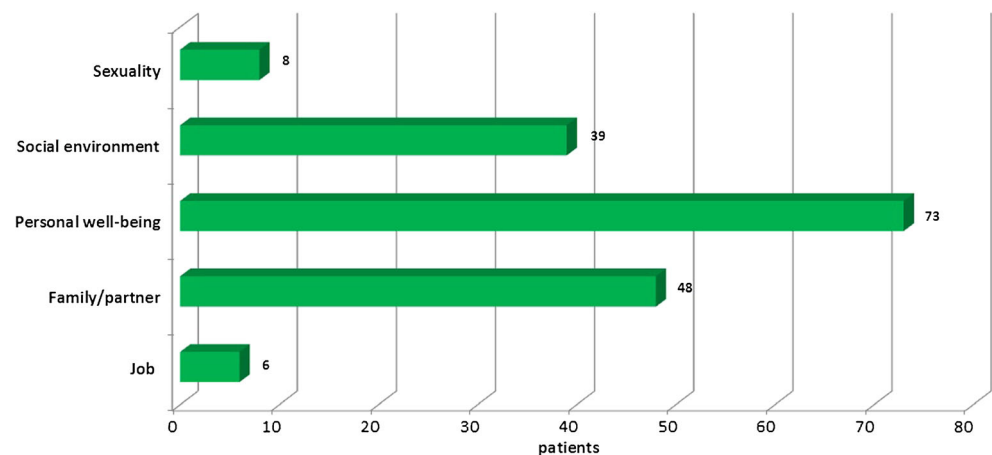
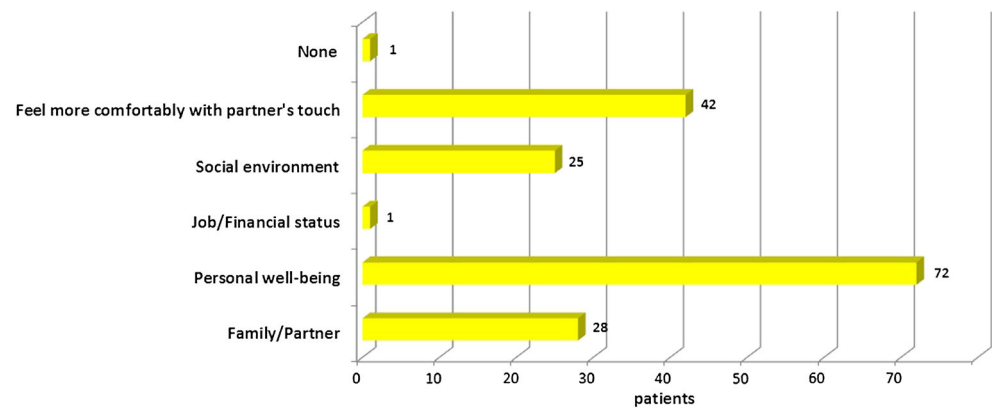


Fig. 4 Changes in patients' way of life postoperatively

considered as a “second line priority intervention” and often greeted with skepticism [20]. Moreover, alarming reports showed up regarding increased depression rates and inferior QOL following breast augmentation. Does breast augmentation as a specific esthetic intervention influence patients' postoperative QOL and health-related QOL (HRQOL)? How is their everyday life and psyche affected? Is there a correlation between breast augmentation and increased depression rates during the follow-up period?

There is a growing number of studies in the literature regarding QOL following breast augmentation. Though reports focusing on surgeon's perspective and his evaluation of the postoperative outcome dominate research, while patients' satisfaction is the one parameter that should be considered as the main focus of QOL-related studies [21], because their perspective and an analysis of their objective and predominantly their subjective satisfaction are parameters of enormous interest.

In order to evaluate QOL “as a whole” postoperatively, a study should use standardized and widely accepted testing instruments assessing a wide range of life quality key points and parameters, such as satisfaction with appearance of the breast, satisfaction during everyday activities, perceptions of sexuality, and psychological status. The latter is particularly underlined by Kalaaji et al. (2013), who are concerned about increased depression and suicide rates after breast

augmentation and indicated patients' psychological status evaluation as extremely important [21]. On the other hand, the majority of studies report about increased satisfaction and better QOL following breast augmentation. However, they either don't include standardized questionnaires proposing the use of new “measuring instruments” or solely evaluate patients' satisfaction with specific aspects of their new breasts (symmetry, size, volume, and contour). The psychological status of the participants and satisfaction with everyday activities remain though unevaluated [22–25]. Another drawback of several studies is the inclusion of heterogeneous patients groups undergoing diverse breast surgery procedures as breast mastopexy with implants, breast reduction, and breast reconstruction and not only breast augmentation. These studies fail in our opinion to demonstrate a detailed evaluation of the outcome due to differences in the preoperative status and perioperative burden of the participants [26]. Finally, a minimum follow-up time able to examine possible complications affecting QOL and HRQOL (chronic pain, psychological disorders) should also be the “*sine qua non*” of such a study. In the present study, we took into consideration all five aforementioned keystones in the assessment of our patients' QOL (evaluation of patients' subjective satisfaction and psychological status, use of standardized testing instruments, homogeneous patients group, and long follow-up period).

In our previous study, we showed prospectively that esthetic surgery in general affects positively patients' QOL increasing their well-being and their satisfaction with their body image [7]. Because that study included different esthetic surgical treatments, no conclusion was possible concerning a single and specific surgical procedure. In our previous study, we showed prospectively that esthetic surgery in general affects positively patients' QOL increasing their well-being and their satisfaction with their body image [7]. Nevertheless, that study included different esthetic surgical treatments so that no conclusion was possible concerning the outcome of a single and specific surgical procedure. As we hypothesized in the aforementioned study, the importance of splitting up the different surgical procedures was underlined in several studies

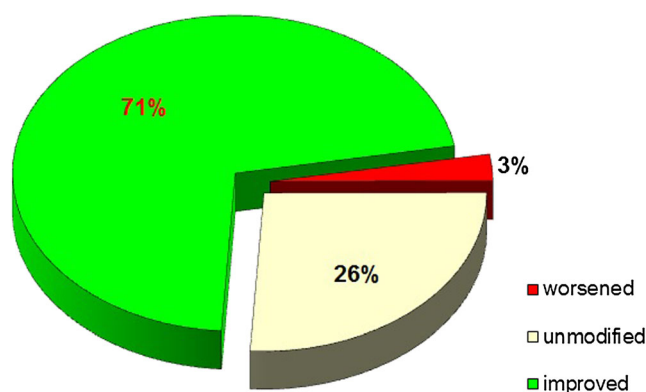
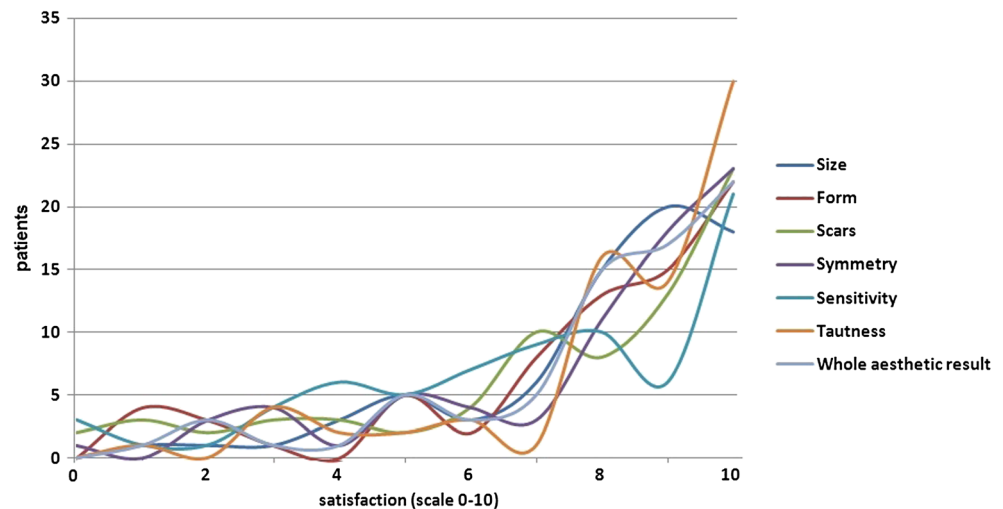
**Fig. 5** Changes in patients' sexuality postoperatively

Fig. 6 Patients' satisfaction (seven parameters)

too [13–15]. Therefore, we carried forward present study focusing on and including solely patients undergoing breast augmentation, comprising thereby a homogeneous group of participants. With an age range of 17–58 years old, they were active members of the society, a conflicting result with what mass media often portray as the “typical breast augmentation patient” [27, 28]. They describe her as a single, young, and rather not judicious woman in her 20s seeking a partner. There are studies that go along with our conclusion too [29, 30].

Few studies exist examining patients' subjective satisfaction postoperatively. We focused on patients' perspective, and her subjective evaluation of the outcome was the key point and main aim of our study. After all, as Kalaaji et al. underline, “she is the one who lives with the outcome of the surgery” [21]. Furthermore, using standardized statistical instruments

including an *importance scale* of every questionnaire item, we managed to evaluate their “weighted” satisfaction with everyday life QOL parameters and with the procedure outcomes too. In that way, items that were rather unimportant for each of them, only slightly influence their QOL and satisfaction (multiplication with 0 or 1, in an importance scale of 0–5). On the other hand, items described as “extremely important” were strong determinants of the outcome (multiplication with 4 or 5, in an importance scale of 0–5). Besides, an intervention's objective outcome described as “very good” by the patient doesn't necessarily lead to an improved QOL.

Patients' QOL postoperatively should be examined as a whole; thus, it is a multidimensional construct. We proved in this study that breast augmentation significantly improved our patients' QOL in general and their “body image” perception,

Table 1 Ten pre- and postoperative “pairs” of everyday's life common activities

	Pre-op	Postoperatively	<i>t</i> test (<i>p</i>)*	Improved/unmodified/worsened
Difficulty to dress	77 % always/often	2.5 % always/often, 92 % never/rarely	<0.001, ss	67/4/2
Difficulty to do sports	55 % sometimes	11 % sometimes, 86 % never/rarely	<0.001, ss	28/34/11
Difficulty while running	79 % never/rarely	92 % never/rarely	0.152, ns	15/43/15
Difficulty to go to pool	75 % always/often	2.5 % always/often, 95 % never/rarely	<0.0001, ss	65/7/2
Satisfaction with my appearance	90 % no/little	2 % no/little, 95 % great/rather	<0.0001, ss	72/1/0
Annoyance in front of a mirror (when dressed)	67 % very/rather	3 % very/rather, 94 % not at all/a little	<0.0001, ss	70/2/1
Annoyance in front of a mirror (when naked)	96 % very/rather	6 % very/rather, 87 % not at all/a little	<0.0001, ss	71/2/0
Annoyance in front of my partner (when dressed)	61 % rather/sometimes	3 % very/rather, 90 % not at all/a little	<0.0001, ss	57/11/2 (3 no partner)
Annoyance in front of my partner (when naked)	73 % very/rather	7 % very/rather, 87 % not at all/a little	<0.0001, ss	68/5/0
Annoyance in front of a mirror (with a bra on)	69 % very/rather (while by 33 %, no bra necessary)	3 % very/rather, 96 % not at all/a little	<0.0001, ss	71/2/0

ss stat. significant

**p*<0.05 (significant statistical differences) (unpaired *t* test)

Table 2 Statistical analysis of “General Life Satisfaction” comparing the study group with the norm data of 2006

	Study group			Norm data 2006 [15]			<i>t</i> test	
	Mean	SD	No.	Mean	SD	No.	<i>t</i>	<i>p</i> *
Friends	9.51	6.11	73	8.7	5.83	2,700	1.16	0.24
Hobbies	5.47	4.22	73	6.26	6.15	889	1.08	0.28
Health	9.57	6.12	73	9.27	7.13	2,696	0.36	0.72
Income	6.33	6.01	73	5.55	6.97	2,697	0.95	0.34
Work	6.84	5.82	73	5.52	7.15	2,655	1.56	0.12
Living conditions	11.21	6.83	73	9.21	6.3	2,695	2.67	<i><0.01</i>
Family life	10.61	7.98	73	10.32	7.2	2,695	0.34	0.74
Partner relationship	9.29	7.38	73	7.39	7.88	2,677	2.04	<i>0.04</i>
Sum score	68.83	31.19	73	62.6	37.2	2,700	1.42	0.16

Italicized entries refer to the fields with the statistical significant difference value $p < 0.05$

ss stat. significant

* $p < 0.05$ (significant statistical differences) (unpaired *t* test)

boosting in parallel their sexuality and ensuring a healthy psychological status. Their “satisfaction with breasts” was, as hypothesized, significantly improved ($p < 0.01$), and the whole “upper body” region too ($p = 0.01$ – 0.03 : shoulders, waist, belly, etc.) (Tables 4 and 5). Coriddi et al. (2013) agree with our results in their recent study underlining that overall satisfaction after breast augmentation is most strongly correlated to satisfaction with appearance of breasts [31]. Higher values were also reached in self-esteem and emotional stability ($p = 0.00$ for both values) when compared to available norm data. Extremely high rates of satisfaction were also obtained in the “standing in front of the mirror without clothes postoperatively” part, a result that proves one of the most important findings of our study: breast augmentation has a direct positive impact both in patients’ self-esteem and sexuality. It is furthermore correlated with the fact that our patients don’t need to hide their small breasts in loose or thick clothes at

work or in front of their partner anymore and tend to wear sexier/tighter clothes during housekeeping as stated by them in the questionnaire. Consequently, breast augmentation has an enormous positive influence on their psyche boosting their sexuality in everyday life.

There aren’t many studies examining common daily activities or the ability of women to participate in their work/job postoperatively following breast augmentation [21]. We managed to shed some light to this field by examining the improved or worsened pre- versus postoperative satisfaction during 10 common activities of everyday life. Nine out of 10 pairs showed statistically significant improvement ($p < 0.001$) (Table 1). These results stay of course in line with higher self-esteem values and increased satisfaction with their whole body after the procedure. Up to 92 % of our patients stated that “I feel better with my body” and “I feel more attractive”, thus reflecting their uplifted mood.

Table 3 Statistical analysis of “Satisfaction with health” comparing the study group with the norm data of 1995

	Study group			Norm data 1995 [13]			<i>t</i> test	
	M	SD	No.	M	SD	No.	<i>t</i>	<i>p</i> *
Fitness	6.91	6.12	73	7.84	6.67	566	1.13	0.26
Ability to relax	8.24	5.17	73	7.26	6.41	562	1.25	0.21
Energy	8.23	5.12	73	9.35	6.45	564	1.43	0.15
Mobility	10.38	7.63	73	8.34	6.9	566	2.35	<i>0.02</i>
Vision and hearing	11.51	6.79	73	10.76	7	565	0.86	0.39
Freedom from anxiety	6.81	4.89	73	8.06	6.54	559	1.58	0.12
Freedom from aches and pains	8.92	6.91	73	9.36	7.08	566	0.50	0.62
Independence from assistance	14.43	6.75	73	12.55	6.79	565	2.23	<i>0.03</i>
Sum score	75.43	32.81	73	73.5	40.91	566	0.39	0.7

Italicized entries refer to the fields with the statistical significant difference value $p < 0.05$

ss stat. significant

* $p < 0.05$ (significant statistical differences) (unpaired *t* test)

Table 4 FLZ^M—weighted satisfaction for the module “Satisfaction with body image” in comparison with T0 data of our previous study

	Study group			Control group T0 [7]			<i>t</i> test
	M	SD	No.	M	SD	No.	<i>p</i> *
Hair	6.62	6.17	73	6.86	6.42	130	0.79
Ears	7.75	5.17	73	7.89	5.45	130	0.86
Eyes	10.17	5.70	73	9.82	6.22	130	0.69
Nose	6.18	5.14	73	6.88	7.03	130	0.46
Mouth	9.72	7.11	73	11.28	21.34	130	0.55
Teeth	8.69	5.72	73	7.68	6.8	129	0.28
Facial Hair	7.94	6.07	73	5.93	6.95	120	0.04
Chin/neck	6.31	5.33	73	5.69	5.79	130	0.45
Shoulders	7.61	4.22	73	6.13	4.98	130	0.03
Breasts	10.81	6.11	73	2.38	14.21	129	0.0001
Abdomen	5.84	6.15	73	1.72	8.17	127	0.0002
Waist	7.04	6.69	73	3.42	7.32	129	0.0006
Hips	6.49	6.06	73	2.57	6.72	127	0.001
Penis/vagina	6.87	5.95	73	6.06	5.48	122	0.33
Buttocks	6.89	5.37	73	4.12	6.89	129	0.0034
Thighs	4.73	5.57	73	2.56	6.94	130	0.02
Feet	5.41	5.53	73	5.31	6.02	130	0.91
Hands	6.44	6.09	73	7.91	5.75	129	0.09
Skin	6.12	6.21	73	7.28	6.93	129	0.24
Body hair	6.86	5.96	73	4.88	6.3	127	0.03
Height	6.37	4.9	73	5.15	5.4	128	0.11
Weight	7.17	6.89	73	3.82	7.56	130	0.002
Sum scores	156.63	62.19	73	121.04	81.41	130	0.0014

Italicized entries refer to the fields with the statistical significant difference value $p < 0.05$

T0 preoperatively, *ss* stat. significant

* $p < 0.05$ (significant statistical differences) (unpaired *t* test)

Saariniemi et al. underlined in their recent study in 2012 the absence of a study that further evaluates the phenomenon of QOL's steady decrease in longer follow-up time in patients undergoing breast augmentation when compared to general population [32]. In the present study, with a mean follow-up time of 8.4 years, we examined our patients' QOL for a long time postoperatively (max. follow-up time more than 10 years) and our results aren't in line with the one aforementioned. Scar pain, comorbidities, or even dissatisfaction with the esthetic outcome were not demonstrated by our participants and they were definitely not reasons leading to a decreased QOL during follow-up time. The significant improvement in the items “mobility” and “independence from help/care” don't speak for persisting chronic pain in every third (33 %) patient undergoing breast augmentation as reported elsewhere [33]. No physical or social role limitation affecting their QOL or everyday activities was registered by our patients. HRQOL

Table 5 FLZ^M—weighted satisfaction for the module “Satisfaction with Body Image” in comparison with T1 data of our previous study

	Study group			Control group T1 [7]			<i>t</i> test
	M	SD	No.	M	SD	No.	<i>p</i>
Hair	6.62	6.17	73	7.09	6.57	130	0.62
Ears	7.75	5.17	73	7.88	5.65	130	0.87
Eyes	10.17	5.70	73	10.35	6.38	130	0.84
Nose	6.18	5.14	73	7.27	5.98	130	0.19
Mouth	9.72	7.11	73	9.37	5.54	130	0.7
Teeth	8.69	5.72	73	8.49	6.93	129	0.83
Facial hair	7.94	6.07	73	6.19	5.87	120	0.04
Chin/neck	6.31	5.33	73	8.40	21.3	130	0.41
Shoulders	7.61	4.22	73	6.18	4.69	130	0.03
Breasts	10.81	6.11	73	7.87	7.66	129	0.01
Abdomen	5.84	6.15	73	3.57	6.9	127	0.02
Waist	7.04	6.69	73	4.32	6.87	129	0.01
Hips	6.49	6.06	73	3.84	6.2	127	0.01
Penis/vagina	6.87	5.95	73	5.95	5.24	122	0.26
Buttocks	6.89	5.37	73	4.41	5.99	129	0.004
Thighs	4.73	5.57	73	3.48	6.7	130	0.18
Feet	5.41	5.53	73	5.51	5.65	130	0.9
Hands	6.44	6.09	73	7.93	6.72	129	0.12
Skin	6.12	6.21	73	6.95	7.25	129	0.41
Body hair	6.86	5.96	73	7.66	16.6	127	0.69
Height	6.37	4.9	73	5.44	5.31	128	0.22
Weight	7.17	6.89	73	4.84	8.2	130	0.04
Sum scores	156.63	62.19	73	144.13	86.5	130	0.28

Italicized entries refer to the fields with the statistical significant difference value $p < 0.05$

T1 3 months postoperatively, *ss* stat. significant

* $p < 0.05$ (significant statistical differences) (unpaired *t* test)

is directly associated with postoperative functional status and subjective satisfaction [34, 35]. Thus, the absence of chronic pain, the high rates of “independence from help/care”

Table 6 Evaluation of the Freiburg Personality Inventory (FPI-R)

FPI-R	No.	Percent
Most stable	36	49.3
More stable	21	28.7
Stable	9	12.3
Rather unstable	7	9.6
Mean/SD	<i>M</i> = 4.7	<i>SD</i> = 2.8
Mean/SD norm data	<i>M</i> = 6.2	<i>SD</i> = 3.6
<i>p</i> = 0.0004*		

Italicized entries refer to the fields with the statistical significant difference value $p < 0.05$

* $p < 0.05$ (significant statistical differences) (unpaired *t* test)

Table 7 Statistical analysis of the RSES Questionnaire

Self-esteem	Mean	SD	<i>p</i> *
Breast augmentation	33	5.3	<i>0.0001</i>
Int. norm data	30.85	4.82	<i>0.0001</i>
German norm data	31.73	—	

Italicized entries refer to the fields with the statistical significant difference value $p < 0.05$

* $p < 0.05$ (significant statistical differences) (unpaired *t* test)

and the improved “mobility” as reported by our participants form a triplet that establish breast augmentation an important determinant of high postoperative HRQOL.

Reports on QOL following breast augmentation do exist but they mainly focus on patients’ satisfaction with the characteristics of their breasts (shape, size, symmetry, etc.) without using standardized measuring instruments [36, 37]. The rating of item’s individual importance is missing as well as the comparison with norm data. Moreover, they lack any clinical outcomes and postoperative clinical examination of the patients. On the contrary, a percentage of our patient group (ca.20 %) was additionally examined clinically during follow-up, allowing us that way to obtain an updated satisfaction status after the procedure. Moreover, it encouraged a strong patient-surgeon partnership providing extensive counseling and dialog opportunities helping toward a better interpretation of the results reported during the questionnaire by the participants. However, we believe that a prospective study is still needed in order to contribute toward a better interpretation of the patients’ desires and expectations prospectively.

Conclusion

Breast augmentation definitely influences the patient’s QOL positively and is an esthetic surgical intervention widely accepted among women. It raised our patients’ *sexuality* postoperatively (although preoperatively not expected by all of them), thus providing them with important *psychological benefits*. Moreover, it brings an appropriate high satisfaction with the esthetic result and is *very well tolerated* from them being accompanied by a *low complication rate*.

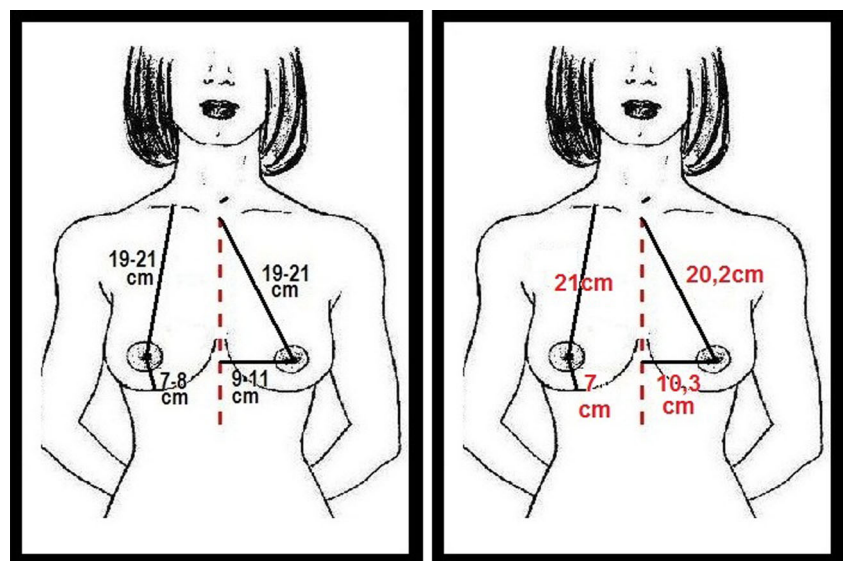
Our patients reached statistic significant higher scores in the FLZ^M module—“Satisfaction with appearance” when compared to respective norm data (breast, 10.81 to 2.38; $p = 0.0001$). Increased satisfaction were found not only for the part “breasts”, but also for “shoulders”, “abdomen”, “waist”, and “hips” ($p = 0.01–0.03$), expanding the intervention’s positive results to the whole upper body region, boosting that way our patients’ self-esteem and self-confidence.

Significant higher results in comparison with norm data were reached for both FLZ^M modules’ (“General Life Satisfaction” and “Satisfaction with Health”) items, confirming the data acquired from our self-developed indication specific questionnaire. An increased score were found, respectively, for the items “living conditions” (11.21 to 9.21, $p < 0.01$) and “partner/sexuality” (9.29 to 7.29, $p = 0.04$) as well as for the items “mobility” (10.38 to 8.34, $p = 0.02$) and “independence from help/care” (14.43 to 12.55, $p = 0.01$).

The participants of our study had further a significant higher self-esteem (33 to 30.85, $p = 0.0001$, RSES questionnaire) and proved a well-balanced emotionality (4.7 to 6.2, $p = 0.0004$, FPI-R questionnaire).

A prospective study is still needed in our opinion, in order to better understand the impact of breast augmentation on the

Fig. 7 The “ideal breasts” measurements (*left*) and the measurements’ mean values during the clinical examination of the participants (*right*)



QOL in correlation with the thoughts and expectations of our patients.

Conflict of interest None.

Ethical standards The manuscript does not contain clinical studies or patient data. All persons gave their informed consent prior to their inclusion in the study.

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